

# **Environmental Education: An Urgent Need for Curriculum Unmet in the U.S.**

**Prepared for the international round-table conference – “Discussion  
between generations: Living with radioactive contamination”  
May, 17-20, 2006 Kiev, Ukraine**

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May, 2006

## Introduction

Learning about the environment is crucial for contemporary and future generations. Recently, environmental issues have affected the United States and international politics. These issues are similar for both the Native American and Ukrainian people. Problems such as air and water pollution, the effects of toxic chemicals on peoples' health, hazardous wastes, and the destruction of wilderness are familiar to both nations and involve discussions about politics and sovereignty. In the twenty-first century, environmental education is becoming inherently an interdisciplinary field that must adopt a holistic perspective and re-examine the political, social, and intercultural aspects of ecological problems. While the environmental agenda is discussed in social and economic activities, it is still not well addressed in the official curriculum. In this paper I would like to discuss the role of education in addressing environmental problems.

## Environmental Problems

As a result of rapid technological and scientific progress, in the last few decades environmental problems have taken on entirely new dimensions. Recent human activities related to nuclear energy development and uranium mining have had irreversible consequences, for example the Chernobyl nuclear explosion in April 1986 in Ukraine. It is a well-known fact now that hundreds of thousands of Ukrainian people died from or developed serious diseases as a result of the Chernobyl disaster. Many still suffer from serious physical and psychological conditions, including immune function disorders. Hundreds of thousands of children have been subjected to the prolonged impact of long-lived radionuclides. According to a 1995 World Health Organization (WHO) report, the total radioactivity of the material released from the reactor in Chernobyl is estimated to be 200 times that of the combined fallout from the atomic

bombs dropped on Hiroshima and Nagasaki. This accident exposed millions of people to various doses of radiation, especially in Ukraine, Belarus, and Russia. Other costs, such as the disposal of radioactive waste from the Chernobyl site, agricultural sites, and forests, have long-term effects.

While the state of New Mexico has not been exposed to such a catastrophe, uranium mining became a serious problem for some of its residents. Although many people think that this is not an important topic anymore because of the absence of new nuclear power plants, the problem continues to persist due to health and cleanup problems, water pollution, and “the fear of future uranium mining that makes uranium a topic that will never go away” (Ortega, 2004). The southwestern states of the U.S., especially Arizona and New Mexico, were exposed to uranium mining from the 1940s through the 1990s. While some of the mines have been cleaned up under the Uranium Mill Tailings Radiation Control Act (UMTRCA), others still get cleaned up under the more lenient state mining reclamation rules:

But mine and mill tailings clean up can be as basic as putting a layer of soil over it and covering it with vegetation to keep it from blowing off (but not necessarily from eroding away). Or it can be as complex as adding liners to prevent erosion into streams and groundwater, with monitoring wells and erosion control devices. And unfortunately, one cleanup method involves raising the minimum contaminants level – in acknowledgement that the water will never be fit to drink. (Ortega, 2004)

The Southwest Research and Information Center (SRIC) in Albuquerque, NM, is one of many organizations which focuses on the problems caused by uranium mining. It assists the Navajo Dine, Crownpoint, Church Rock, and other communities in preventing new types of

uranium mining. In the past, these communities have experienced contamination of their drinking water and the spread of health problems related to uranium mining:

For years, doctors in these affected communities have watched people develop lung cancer, stomach cancer, and even kidney diseases, wondering if the past uranium mining have caused some of these health problems. (Ortega, 2004).

The SRIC staff in Albuquerque is working on these issues with Native American authorities and internationally. Locally, they work with the Navajo Nation, various government entities, and medical staff to find solutions to various problems related to uranium mining.

Starting in summer 2004, the New Mexico Environment Department (NMED) is conducting “Listening Sessions” as a way for the public to comment on environmental problems. The Listening Sessions are held in four locations throughout the state, and aim to discuss the topic of environmental justice (Ortega, 2004). The committee of these sessions consists of government agency members, industry representatives, New Mexico Environment Department representatives, and members of the public. The topics discussed during these sessions address issues related to hazardous solid wastes, uranium mining, the impact of agriculture on water and air quality, and illegal dumping. One of the speakers, Phil Harrison, pointed out medical and socioeconomic aspects of the problem:



Our communities have been impacted by uranium mining and milling, including adverse health effects among low income minority people such as lung cancers, kidney disease and birth defects. I have hopes that NMED will recognize that the injustices and damage we have faced will not go away and will have to work with people to help restore our people and our land.” (Ortega, 2004).

Other speakers from the Laguna, Acoma, and Santa Clara Pueblos also note the political aspect of the problem, such as the fact that facilities involved with toxic solid wastes and illegal dumping are usually located in low-income Native communities.

Nor have the deadly effects of uranium mining in the southwestern United States been limited only to environmental damage. Studies tracking respiratory diseases among Navajo uranium miners have consistently shown a correlation between this work and lung cancer, tuberculosis, and pneumoconiosis and other respiratory diseases (Roscoe, Deddens, et al., 1995).

When comparing the environmental damage on Native American lands to that caused by the Chernobyl nuclear explosion, one finds many similarities. Just as hundreds of thousands of Ukrainians have suffered from health problems caused by radioactive exposure, thousands of Native Americans in the U.S. have developed health problems related to uranium mining and other shortsighted environmental abuses. Problems with contaminated water and polluted soil still persist today in both New Mexico and Ukraine. In both cases, the diseases caused are often incurable and deadly; the environmental damage is very long-term. There are political and economic similarities to be found as well. Both uranium mining on Native American lands and the Chernobyl disaster demonstrate a greed for energy being met at the expense of a people under-represented at a distant seat of political power. In both countries, the threat of similar damage continues into the foreseeable future, so long as powerful interests promote the demand for more energy at the possible expense of public safety. While the links between radioactivity and genetic effects are still not fully understood, it became clear to both nations that the damage caused by radioactivity is inevitable and irreversible.

Indeed, the problem of past disasters includes the competing problems of politics and economics. Another aspect of its complexity involves the selective information which forms

public opinion on the issues of the nuclear industry. For example, communities often support nuclear power once they become economically dependent upon it, or become politically dependent upon the imperialistic governments. Taking into account the extremely long time periods for radioactive decay (stretching to many thousands of years for some isotopes) and often the international conflict of interests (illegal exports of hazardous wastes), this problem becomes one of global significance requiring international action. Since decisions affecting the environment are made by those with political and economic power, they require the critical analysis of the public and the understanding of the parties involved in these decisions. Since the problem of radioactive waste involves the risk of irreversible damage to the environment and the health of the future population, the environmental education of young generations becomes key to this issue.

### Problems in Environmental Education

Given the potential scale of disaster that can result from nuclear materials (e.g. the Chernobyl accident 1986; Windscale/Sellafield, UK, 1957; Three Mile Island, Harrisburg, USA, 1979), the weakness of international and governmental oversight seems surprising. Throughout the history of the nuclear industry, many states and their authorities have been unwilling to accept responsibility for control over their activities. While the general awareness to these problems increases, much of the information related to nuclear issues remains secret and is certainly not represented in educational textbooks. The perspectives on environmental problems in educational curriculum materials (if presented at all) usually reveals as a casual reading of the environmental literature:

Definitions and understanding of any public problem are affected by political ideologies and values, professional training, and experience, which vary greatly across society and among scientists and policy makers (Kraft, 1996, p.5).

Discussion about the environment is often limited to one about endangered species and their habitats (view Harcourt, McGraw Hill, Prentice Hall and similar textbooks publishers in the U.S.). Many of these publishers may believe that improving students' knowledge about radioactive waste will increase the "unnecessary" threats. Most of the public school teachers in New Mexico are required to use certain types of state-adopted textbooks and are limited in their choice of lesson plans. Others can pretty much teach what they want. With this situation in public education, discussion about the risks to human and ecological health of radioactive waste is often neglected. The connection between the western industrial lifestyle and environmental values and ethics is hardly addressed in any educational discussion. These values are presented by Catton and Dunlap's (1980) paradigm below:

Humans are fundamentally different from all other species on earth over which they have dominion; people are masters of their destiny and can do whatever is necessary to achieve their goals; the world is vast and provides unlimited opportunities for humans; and human history is one of progress in which all major



problems can be solved (Kraft, 1996, p.7).

It is clear that other premises that are formed from these beliefs constitute institutional behaviors and lead to the low valuation of nature, the primacy of economic well-being, and the risks associated with nuclear energy (Kraft, 1996). Clearly, such values affect peoples' behavior, lead to the misrepresentation of environmental issues in students' textbooks, and with that,

environmental degradation. This negative impact on science education (which supports this worldview) has a detrimental effect on future generations and global environmental change.

### Recommendations for Environmental Education

As a graduate student of the University of New Mexico's College of Education I have a strong belief that environmental education is key to the long term resolution of global environmental problems. Education, assisted by the mass media and international collaboration, should arouse the awareness of these problems in formal education systems. Based on historical facts and objective information, environmental education and environmental curriculum specifically, should involve students in active and global problem-solving activities. The environmental issues should be introduced on all levels of official education and restore the ethical function of peoples' activities with nature. Indeed, education is a field which shapes humans' behaviors with the environment. Thus, education should be viewed in the context of analysis of environmental problems and its relation to politics, social sciences, and communication. The need for protection of the environment and for new ideas regarding environmental education in formal education is an essential and urgent need.

Environmental education should be integrated into all levels of formal education and provide students with necessary knowledge, historical facts, values and skills needed for active problem solving of environmental questions. Since this topic often involves a conflict of interest between political and economic groups, environmental education in schools should address the topics of political and ecological interdependence, mortality, health problems, markets and consumption, technology, population, and solidarity between nations in resolving these problems. Although the process of educational curriculum development depends on available



resources, the preferences of the local school boards, and district needs, international cooperation on this topic and global needs for environmental actions should be considered in all levels of academia. Clearly, if accidents such as the Chernobyl nuclear explosion, the effects of uranium mining, and radioactive wastes are not addressed in state-adopted textbooks, curriculum planning priorities should be reconsidered. District and school leaders should have the right to address these important topics in formal teaching assessments.

Below is an example of the environmental program designed by the New Mexico doctoral student Michael LaFlamme. The purpose of his project is to design a new Lake InterActive Center and improve the care of fish and the environment of Flathead Lake. (LaFlamme, 2004):

If you want to work with me, you may:

1. Write, draw and talk about the relationships among people, fish and the Flathead Lake environment;

2. Observe and learn about Flathead Lake, and write or draw your observations;

You will keep your drawings and writings. I will copy them, and photograph, tape record, or videotape some of our activities.

Your drawings, writings, and conversations may be used to help create:

1. a booklet about the project, and you will get a copy;
2. displays at the Flathead Lake InterActive Center;
3. a better plan for the Flathead Lake and rivers;
4. an educational video, for possible broadcast.

Other of LaFlamme's projects include students' examination of insects and zooplankton (for lakes), streambed geology, observations of human actions and sounds near the lake, water

quality, temperature and clarity, and other nature-related activities for middle and high school students. This habitat-approach curriculum presents a good example of environmental education in a regional setting. It provides students with an opportunity to examine the sustained contact between people and local environment, to interpret that behavior, and draw conclusions from students' own contact with nature. The study recommends a behavioral-ecology approach for motivating conservation and environmental education in local communities. (LaFlamme, 2004)

### Conclusion

Since environmental education has become an interdisciplinary field, the role of coordinating international cooperation in this topic cannot be overstated. The role of education in solving environmental problems is crucial. While many initiatives on this topic have been undertaken in a number of countries, an environmental curriculum has never been fully developed and included for official education in the U.S. There are still not enough teachers trained for the teaching of ecology. Since environmental education encompasses a multidisciplinary field of studies, it is critical to consider and implement various methods of in-school and outdoor activities as a part of official curriculum at all levels of education. The need to design environmental curricula and to prepare textbooks and special guides for teachers will only grow more urgent as the increasing demand for energy accelerates environmental exploitation.

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